AMENDMENTS TO THE CLAIMS

1. (currently amended) A method of accepting a selection of a cross-section of a voxel dataset and of projecting visual information representative of data in the cross-section,

the selection being indicated by a human user making an alteration in the shape of a physical object,

the physical object having a position and shape that defines a three dimensional surface, and

the voxel dataset being stored in digital memory and comprising a set of data values in a three-dimensional array,

which method comprises, in combination, the steps of:

employing a first sensor to produce sensor data regarding the physical object after the alteration occurs, and

employing a processor

to process the sensor data to determine the position and shape of the three dimensional surface, and

to identify the cross-section, which cross-section comprises a subset of the data values with positions in the three-dimensional array that correspond to the three dimensional surface, and

projecting onto the three dimensional surface an image representative of the subset of data values that comprise the cross-section.

~~The method for evaluating a three dimensional set of point values , said method comprising, in combination, the steps of:~~

~~storing said three dimensional set of point values in a digital memory device,~~

~~forming a physical object which defines a three dimensional surface,~~

~~employing one or more real-time position and geometry sensors to produce surface geometry data specifying the geometry and position of said three dimensional surface,~~

~~employing a processor coupled to said digital memory and to said real-time position and geometry sensors to compare said set of point values to said surface geometry data to identify a subset of said point values that are congruent with corresponding locations in said three dimensional surface currently specified by said surface geometry data,~~

~~projecting an image representative of said subset of point values onto said three dimensional surface of said physical object, and~~

~~manually manipulating said physical object to reposition said three dimensional surface to cause a new image representative of a different subset of said point values to be projected onto said three dimensional surface.~~

2. (currently amended) The method ~~for evaluating a three dimensional set of point values as set forth in~~ of claim 1 wherein said physical object comprises a deformable material that may be shaped to alter the position of said three dimensional surface.

3. (canceled)

4. (currently amended) The method ~~for evaluating a three dimensional set of point values as set forth in~~ of claim 1 wherein said ~~one or more real-time position and geometry~~ first sensor[[s]] comprises a ~~include one or more~~ laser scanner[[s]].

5. (currently amended) The method for ~~evaluating a three dimensional set of point values as set forth in~~ of claim 1 wherein said physical object is formed from a translucent material and wherein said ~~one or more real-time position and geometry~~ sensor[[s]] measures the position of said surface by measuring the extent to which light is attenuated when passing through said translucent material to reach said surface.

6. (currently amended) The method ~~for evaluating a three dimensional set of point values as set forth in~~ of claim 5 wherein said physical object comprises an aggregation of ~~translucent~~ moveable objects.

7 – 12. (canceled)

13. (Currently amended) Apparatus for accepting a selection of a cross-section of a voxel dataset and of projecting visual information representative of data in the cross-section,

the selection being indicated by a human user making an alteration in the shape of a physical object,

the voxel dataset being stored in digital memory and comprising a set of data values in a three-dimensional array,

which apparatus comprises ~~evaluating a three dimensional array of data values comprising,~~ in combination,

the ~~manually manipulatable~~ physical ~~object~~ object, which is manually manipulatable and defines a three-dimensional surface whose shape or position may be altered,

a position sensor for generating position data specifying the current geometry of said surface,

a memory device for storing said voxel dataset ~~three dimensional array of data values~~,

a processor coupled to said position sensor and to said memory device for comparing said ~~three dimensional array of data values~~ voxel dataset with said position data to identify selected ones of said data values which have positions in said array that correspond to the current geometry of said three-dimensional surface, and

a projector for illuminating said three-dimensional surface of said physical object with an image representative of said selected ones of said data values as the shape or position of said three-dimensional surface is altered during the manual manipulation of said physical object.

14. (currently amended) The apparatus of ~~Apparatus for evaluating a three dimensional array of data values as set forth in~~ claim 13 wherein said physical object comprises a deformable material that may be manually manipulated to alter the position of said surface.

15. (currently amended) The apparatus of ~~Apparatus for evaluating a three dimensional array of data values as set forth in~~ claim 13 wherein said physical object is constructed of a material which forms a surface whose geometry varies when said object is manually manipulated and upon which an image may be projected and viewed by [[a]] said human user.

16. (currently amended) The apparatus of ~~Apparatus for evaluating a three dimensional array of data values as set forth in~~ claim 15 wherein said physical object comprises a deformable material that may be shaped to alter the shape or position of said three dimensional surface.

17. (currently amended) The apparatus of ~~Apparatus for evaluating a three dimensional array of data values as set forth in~~ claim 15 wherein said physical object comprises an aggregation of smaller movable objects which are adapted to be ~~individually~~ moved to alter the shape or position of said surface to vary said image.

18. (new) The method of claim 1, wherein the cross-section is curved.

19. (new) The method of claim 1, wherein each data value in the voxel dataset is indicative of a value measured by one or sensors other than the first sensor with respect to a volume element of a volume, which volume does not include the physical object.

20. (new) The method of claim 1, wherein each data value in the voxel dataset represents a value measured with respect to a volume element of tissue.

21. (new) The method of claim 1, wherein the data values in the voxel dataset are not parameters of the physical object or of any deformable template that the processor is adapted to elastically match with the physical object.

22. (new) The method of claim 1, further comprising the step of employing the processor to convert the subset of voxel values to image values.

23. (new) The method of claim 1, wherein the voxel dataset changes over time, causing the image to vary over time.

24. (new) The method of claim 1, wherein the alteration is made by the human user manipulating the physical object.

25. (new) The apparatus of claim 13, wherein the cross-section is curved.

26. (new) The apparatus of claim 13, wherein each data value in the voxel dataset is indicative of a value measured by a sensor other than the position sensor with respect to a volume element of a volume, which volume does not include the physical object.

27. (new) The apparatus of claim 13, wherein the data values in the voxel dataset are not parameters of the physical object or of any deformable template that the processor is adapted to elastically match with the physical object.